

WHAT IS CLAIMED IS:

1 *Sub*  
2 *2*  
3 *B1*  
4 1. An intravascular balloon catheter comprising:  
5 a catheter body having a proximal end, a distal end, and a guidewire lumen  
therebetween; and  
a first balloon structure having a passage which is slidably receivable over  
the catheter body.

1 2. ~~An intravascular balloon catheter as in claim 1, wherein the~~  
2 catheter body comprises a tubular member having at least one lumen.

1 *Sub B17*  
2 3. An intravascular balloon catheter as in claim 1, wherein a  
perimeter of the catheter body has a circular, oblong, or elliptical shape.

1 4. An intravascular balloon catheter as in claim 1, wherein the distal  
2 end of the catheter body is axially tapered for a length of at least 3 mm.

1 5. An intravascular balloon catheter as in claim 1, further comprising  
2 an atraumatic tip at the distal end of the catheter body.

1 6. An intravascular balloon catheter as in claim 1, wherein the  
2 catheter body is formed from a polymer material, a composite material, a braided  
3 material, or a metal material.

1 7. An intravascular balloon catheter as in claim 1, wherein the  
2 catheter body comprises multiple tubular members coupled to one another.

1 *Sub*  
2 *2*  
3 *B1*  
4 8. An intravascular balloon catheter as in claim 1, wherein the balloon  
structure comprises an inflation tube extending proximally from the balloon when the  
balloon is disposed near the distal end of the catheter body.

1 *Sub B17*  
2 9. An intravascular balloon catheter as in claim 8, wherein the  
inflation tube has sufficient column strength to advance the balloon structure over the  
3 catheter body.

1 10. ~~An intravascular balloon catheter as in claim 8, wherein an axial~~  
2 groove is formed over at least a portion of the length of the inflation tube to removably  
3 receive a portion of the catheter body.

Sub B1  
11. An intravascular balloon catheter as in claim 10, wherein the  
2 groove has a length in the range from 10 cm to 150 cm and an opening in the range from  
3 0.001 inches to 0.014 inches.

12. An intravascular balloon catheter as in claim 8, wherein the  
2 inflation tube has a length in the range from 10 cm to 150 cm.

13. An intravascular balloon catheter as in claim 1, wherein the  
2 catheter body has an inflation lumen which mates with an inflation port on the balloon  
3 structure wherein the balloon structure is disposed near the distal end of the catheter  
4 body.

14. An intravascular balloon catheter as in claim 13, wherein the  
2 balloon structure comprises a deployment shaft extending proximally from the balloon  
3 when the balloon is disposed near the distal end of the catheter body.

15. An intravascular balloon catheter as in claim 1, wherein the  
2 catheter body is substantially free from structure at the proximal end which would  
3 interfere with passage of the balloon structure over the proximal end of the catheter body.

16. An intravascular balloon catheter as in claim 1, further comprising  
2 an expandable vascular prosthesis disposed over the first balloon structure.

17. An intravascular balloon catheter system comprising a balloon  
2 catheter as in claim 1, further comprising a second balloon structure having a passage  
3 which is slidably receivable over the catheter body.

18. An intravascular balloon catheter system as in claim 17, further  
2 comprising an expandable vascular prosthesis disposed over the second balloon structure.

19. An intravascular balloon catheter as in claim 1, wherein the  
2 catheter body is axially slit over at least a portion of the length of the guidewire lumen.

20. An intravascular balloon catheter as in claim 1, wherein the  
2 catheter body is spirally slit over at least a portion of the length of the guidewire lumen.

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21. An intravascular balloon catheter as in claim 1, wherein an axial slit is formed over at least a portion of the length of the catheter body to removably receive an inflation tube of the balloon structure.
22. An intravascular balloon catheter as in claim 1, wherein the catheter body has a length in the range from 50 cm to 200 cm, and outer diameter in the range from 1 F to 10 F, and a guidewire lumen diameter in the range from 0.2 mm to 2 mm.
23. An intravascular balloon catheter as in claim 1, wherein the balloon structure further comprises an inner sleeve having an inflatable balloon disposed over an outer surface of the inner sleeve, wherein the passage is formed axially in the inner sleeve.
24. An intravascular balloon catheter as in claim 23, wherein the inner sleeve has a length in the range from 3 cm to 50 cm and the inflatable balloon has a length in the range from 1 cm to 5 cm.
25. An intravascular balloon catheter as in claim 23, wherein at least a portion of the inner sleeve is slidably receivable over the catheter body.
26. An intravascular balloon catheter as in claim 1, further comprising a deployable embolic capture element on the catheter body.
27. An intravascular balloon catheter as in claim 26, wherein the deployable embolic capture element is located within 20 cm of the distal end of the catheter body.
28. An intravascular balloon catheter as in claim 1, further comprising a deployable embolic capture element on the first balloon structure.
29. An intravascular balloon catheter as in claim 1, further comprising a second balloon on the catheter body.
30. An intravascular balloon catheter as in claim 29, further comprising an expandable vascular prosthesis disposed over the second balloon.

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1 31. An intravascular balloon catheter as in claim 1, further comprising  
2 a self-expanding vascular prosthesis on the catheter body.

1 32. An intravascular balloon catheter as in claim 31, wherein the  
2 vascular prosthesis is distal the balloon structure in an unexpanded state.

1 33. An intravascular balloon catheter as in claim 31, wherein the  
2 vascular prosthesis is at least partially under the balloon structure in an unexpanded state.

1 34. An intravascular balloon catheter as in claim 1, further comprising  
2 an atherectomy element coupled to the distal end of the catheter body.

1 35. An intravascular balloon catheter as in claim 1, further comprising  
2 at least one pressure sensor coupled to the distal end of the catheter body.

1 36. An intravascular balloon catheter as in claim 1, further comprising  
2 at least one infusion port at the distal end of the catheter body.

1 37. An intravascular balloon catheter as in claim 1, further comprising  
2 a second catheter body having a passage which is slidably receivable over the catheter  
3 body.

1 38. A method for balloon exchange over a catheter body, said method  
2 comprising:

3 withdrawing a first balloon structure over a catheter body in a proximal  
4 direction, wherein said catheter body remains in place over a guidewire in a blood vessel;  
5 and

6 introducing a second balloon structure over the catheter body in a distal  
7 direction, wherein said catheter body remains in place over the guidewire in a blood  
8 vessel.

1 39. A method as in claim 38, wherein the balloon structure that is  
2 introduced over the catheter body is not the same as the balloon structure that is  
3 withdrawn over the catheter body.

1 40. A method as in claim 38, further comprising expanding the first  
2 and second balloon structures which have been introduced to the blood vessel.

1 41. A method as in claim 40, wherein at least one of the balloon  
2 structures are carrying a vascular prosthesis which is deployed into the blood vessel by  
3 balloon expansion.

1 42. A method as in claim 40, wherein expanding the balloon structure  
2 comprises introducing an inflation medium through an inflation tube connected to the  
3 balloon structure.

1 43. A method as in claim 40, wherein expanding the balloon structure  
2 comprises introducing an inflation medium through an inflation lumen in the catheter  
3 body.

1 44. A method for balloon withdrawal over a catheter body, said  
2 method comprising:  
3 withdrawing a first balloon structure over a catheter body in a proximal  
4 direction, wherein said catheter body remains in place over a guidewire in a blood vessel.

1 45. A method for balloon introduction over a catheter body, said  
2 method comprising:  
3 introducing a first balloon structure over the catheter body in a distal  
4 direction, wherein said catheter body remains in place over the guidewire in a blood  
5 vessel.

1 46. A kit comprising:  
2 a catheter body;  
3 a first balloon structure removably replaceable over the catheter body; and  
4 instructions for use setting forth a method as in claim 15.

1 47. A kit as in claim 46, further comprising a second balloon structure.

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